An

Interim Report

From the

Kentucky Energy Policy Advisory Board

To

Governor Paul E. Patton

"A Foundation of Strength: A Long-Term Energy Strategy for the Commonwealth of Kentucky"

December 2002

Brigadier General
James E. Bickford

This Interim Report is dedicated to Secretary James E. Bickford who provided wisdom and guidance to the Kentucky Energy Policy Advisory Board. He will be remembered as a tireless advocate for environmental protection.

kentucky energy policy
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A Message from the Governor

The energy sector has been a keystone in Kentucky's economic and cultural development, a role it will continue to play into our future. The advantages offered by our *low-cost energy* strengthen our position as we strive to create and retain quality jobs for all citizens.

We are working to develop energy strategies that will allow Kentucky to grow. We have taken an important *first step* to help ensure that we preserve what is best about Kentucky's environment and quality of life as our energy sector and economy continues to develop.

The need for this effort became apparent when applications were filed with the Commonwealth for twenty-nine power plants over an 18-month period. In May 2001, I created the Kentucky Energy Policy Advisory Board because it was time for bold action that focused on a collaborative effort to improve the quality of life for our citizens and the business climate for our energy industries.

The Board was charged with a variety of responsibilities. One of the most important was the creation of an energy policy and strategic agenda for our Commonwealth. This interim report reflects the work to date of the five subcommittees that represent the energy sector in Kentucky: Coal, Electricity, Natural Gas and Petroleum, Energy Efficiency and Alternative Energy, and Nuclear Energy. Our goal was to be inclusive and to make sure that all voices and points of view were heard in the initial attempts at gathering possible policy recommendations. These efforts will put Kentucky in a proactive mode to determine its highest attainable energy goals.

This interim report and the resulting final energy policy that will follow, will encourage the efficient and environmentally responsible use of all forms of energy – promoting affordable energy supplies while improving energy reliability and enhancing health, economic well-being and environmental quality.

A long-term energy strategy also represents an important opportunity to craft a meaningful energy policy. *The policy recommendations outlined in this Interim Report establish a foundation on which we can build a long-term energy strategy* and bright energy future that will benefit our children and the generations of Kentuckians that follow.

Paul E. Patton

A Message from the Chair/Executive Director

Governor Patton asked the Kentucky Energy Policy Advisory Board (KEPAB) to develop a long-term energy strategy for the state that focuses on minimizing the environmental impact of the energy industry while maximizing future economic development opportunities and meeting the state's future infrastructure requirements. It has been well documented that states that balance the environment, energy and infrastructure are the most successful in attracting and retaining high-quality jobs. Kentucky wants to be a leader in that area.

It is critical that Kentucky takes charge of its energy and economic future. The Governor's charge to the Advisory Board was to create a plan based on science and technology that encompassed the views of all stakeholders. Consumer advocates, economic development specialists, environmentalists, energy experts from a variety of fields, and representatives of the public and private sectors were invited to join forces in the development of Kentucky's first long-term energy plan. The initial results and policy recommendations in this interim report reflect that work. <u>While these initial policy recommendations of the five subcommittees may appear to conflict, they are not mutually exclusive. Energy efficiency and environmental stewardship can co-exist with the interests of the coal, natural gas and petroleum and the electric utility industry.</u>

Our goal was to develop a sensible, appropriate and responsible energy and environmental policy for the citizens of the Commonwealth. As a result, a research team from the University of Kentucky was assembled to project domestic energy trends over the next 20 years and determine how those trends might affect the state's energy sector. In conjunction, five subcommittees worked to determine the strengths and weaknesses of each of the major components of the energy industry present in the state. Based on that work, <u>interim energy policy recommendations</u> have been made in this document for the Governor's review and approval. <u>*Following that, additional work and meetings will be required to formulate the final energy policy for the Commonwealth.*</u>

We have enjoyed a tremendous amount of success as a result of the Governor's leadership, the hard work of our conscientious board members and open communication with the public, industry and the environmental community on a variety of issues. I would like to extend my sincere thanks to all of the participants in this lengthy process that has yielded great results and laid the <u>initial groundwork</u> for "A Foundation of Strength" for the Commonwealth of Kentucky's energy future.

Annette C. DuPont-Ewing

Who We Are

Governor Paul E. Patton established the Kentucky Energy Policy Advisory Board (KEPAB) in May 2001 to develop a statewide energy policy. KEPAB's challenge is to set long-term standards for energy stewardship while balancing the needs of environmental protection and economic growth for the Commonwealth.

Governor Patton's Vision

Governor Patton has pursued a policy of promoting the economic development of the energy sector, while protecting the environment and enhancing the quality of life for the citizens of the Commonwealth.

As a result of increased energy demand and advances in technology, the energy industry is changing rapidly. Specifically, the nation's electricity sector, traditionally consisting of regulated monopolies, is shifting focus from local to regional markets. As a result, a robust regional wholesale market has developed, as has a merchant power plant industry. Kentucky has witnessed these changes firsthand. Between September 1998 and January 2002, twenty-five merchant power plant air permit applications were filed by representatives of the merchant power plant industry. There also were four applications for regulated utility power plants.

The nation's aging transmission system was not designed to handle the additional capacity requirements resulting from the regionalization of the electricity market. The regionalization of markets encourages the flow of electricity across the country, complicating how states site new electric generation plants. In addition, the planning, siting and certification of the associated transmission infrastructure has become more complex. The cumulative impact of increased wholesale power transactions on the state's electricity infrastructure and the environmental impact of new power plants are unknown.

Domestic and international energy trends will continue to affect Kentucky's energy sector, both directly and indirectly. Congress currently is considering national energy policy legislation. The Governor continues to promote a proactive approach to environmentally sensitive technologies, research and development, and the creation of a long-term energy strategy for the state that will allow the Kentucky to reach its energy goals. This Interim Report and the subcommittee's energy policy recommendations will form thew basis for the future long-term energy plan. The long-term energy plan seeks to maintain Kentucky's low-cost energy competitive advantage and promote the wise use and development of the state's natural energy resources.

Executive Summary

A Foundation of Strength: A Long-Term Energy Strategy for the Commonwealth of Kentucky

When Governor Paul E. Patton established the Kentucky Energy Policy Advisory Board (KEPAB) in May 2001, he charged it with developing an energy policy to guide the Commonwealth through the next twenty years.

The commitment he conveyed to the Board – and the commitment the Board embraced – was to the development of Kentucky's energy sector, the protection of the state's environment and the enhancement of the quality of life for its citizens.

Through a process that spanned many months and involved over 150 Kentuckians in hundreds of hours of meetings, the KEPAB gathered research and heard presentations from experts and consumers regarding an array of energy topics and viewpoints.

Five subcommittees were formed: Coal, Electricity, Natural Gas and Petroleum, Energy Efficiency and Alternative Energy, and Nuclear Energy. This Interim Report distills the information that resulted from the subcommittees' efforts and provides five sets of interim policy recommendations that will frame the final long-term energy strategy for the Commonwealth of Kentucky.

The Process

The KEPAB followed the strategic planning process set out by the Empower Kentucky Center of Excellence in Government office. Success in the project was dependent on adherence to the process. The KEPAB made great progress in their planning efforts, but their work was diverted by time constraints. In an effort to continue the collaborative approach to which the stakeholders had become accustomed, without sacrificing quality, the KEPAB is providing the interim policy recommendations of the subcommittees. Each subcommittee had divergent interests and goals and these are reflected in the interim policy recommendations.

These interim recommendations are not mutually exclusive. Instead, they form a policy umbrella which is necessary for the success of the long-term plan. Continuing high-level discussion, an inclusive process that allows all stakeholders' voices to be heard and sustained industry involvement will provide the path forward toward finalization of the energy plan.

The University of Kentucky Trends Team and the Kentucky Consortium on Energy and Environment have expressed an interest in reconvening the groups that participated in the process. The KEPAB encourages the continuation of that process of working toward the goal of issuing a final energy policy.

A foundation piece of information for the Board's work was a trends analysis conducted by University of Kentucky researchers. The details offered in the analysis emphasized the researchers' conclusion that three forces will shape the future of the energy industry:

- Regulation/Deregulation
- Environmental Performance
- Technology Innovation

Envisioning Kentucky's energy future in the context of the influence of these forces provided the framework for the Advisory Board's "Interim Report" and recommendations in the areas it identified as critical to the future development of a long-term state energy policy:

- Energy Education and Consumer Awareness
- Technology
- Adequate Kentucky-Based Electric Generation and Environmentally Responsible Use of Kentucky Coal
- Natural Gas and Petroleum Issues
- Energy Efficiency and Alternative Energy Applications
- Nuclear Industry
- Long-Range Energy Issues

Following is an overview of the Advisory Board's policy recommendations in each area.

Energy Education and Consumer Awareness

Based upon the initial work of the Subcommittees', the Board's preliminary recommendations are:

- Create an Energy Education Development Program for elementary and secondary schools to enhance learning about energy issues. Elements would include workshops, curriculum development, teacher training, internships, awards for energy-related projects and networking.

- Develop a comprehensive energy awareness and education program targeting the general public, policymakers, post-secondary education and the state's workforce.

- Create scholarships to Kentucky's post-secondary institutions for students in energy-related fields.

- Partner government and industry to create programs to increase general awareness in Kentucky of the role that energy industries play in the state's economy.

Technology

Based upon the initial work of the Subcommittees', the Board's preliminary recommendations are:

- Create an Energy Council representing key stakeholders to ensure coordinated strategies to secure federal research and development funds and in the development of policy initiatives.

- Explore the possibility of allocating a portion of the coal severance tax and other fossil fuel taxes to fund the research and development activities of the Energy Council.

- Develop centers of excellence to promote research and development in energy efficiency, renewable and alternative energy sources, the nuclear industry, coal, oil and gas.

Adequate Kentucky-Based Electric Generation and Environmentally Responsible Use of Kentucky Coal

Based upon the initial work of the Subcommittees', the Board's preliminary recommendations are:

- Explore the feasibility of offering tax credits, accelerated depreciation or other incentives to help the private sector develop technologically advanced coal-fired generation capacity.

- Investigate the use of coal extraction and advanced delivery technology that will stimulate coal production while minimizing the impact on the environment and communities.

- Work with regional utilities and energy planners to become a leader in energy infrastructure development.

- Ensure that recipients of power generated by coal-by-wire facilities in Kentucky fully fund all costs associated with them.
- Identify impediments to investing in and recovering the costs associated with energy-related projects.

- Convene a national discussion to identify alternative markets for Kentucky coal and determine methods to make Kentucky coal more competitive.

- Maintain Kentucky customers' priority access to the state's low-cost electricity.

Natural Gas and Petroleum

Based upon the initial work of the Subcommittees', the Board's preliminary recommendations are:

- Encourage investor-owned and municipal utilities' cooperation with GIS/mapping professionals to produce detailed maps of the intrastate pipeline system and ensure appropriate guidelines be developed to ensure the availability of information to persons with legitimate interests.

- Utilities, pipelines and state agencies collaborate to assemble an information database about past and current gas fields to speed the identification and development of new natural gas storage fields.

- Producers, intrastate pipelines and distributors need to determine what economic policies will encourage investment in state-of-the-art exploration and production equipment and communicate this to state government officials.

- A solution be found, by legislation or other means, to the issues surrounding mineral rights ownership of coal bed methane reserves.

- The state work with industry leaders and educators to create incentives to attract more students to energy-related fields of study.

Energy Efficiency and Alternative Energy Applications

Based upon the initial work of the Subcommittees', the Board's preliminary recommendations are:

- Require new state government buildings to be highly efficient and use integrated design procedures.

- Institute net metering, allowing consumers to run their meters backward when they generate more energy than they use.

- Diversify the state's energy portfolio through a renewable standard that encourages utilities to generate a certain percentage of their power from renewable resources.

- Establish incentives such as rebates or tax credits for energy efficiency and alternative energy technologies.

- The Kentucky Public Service Commission should review the efficiency procedures that require constructers of electric generation units to assign monetary value to the environmental, health and other risks associated with various energy sources when they plan construction projects.

- Allow companies to claim credit under the state's plan to reduce air pollution when they improve energy efficiency or install alternative technologies.

- The Public Service Commission should conduct a hearing directed to analyzing the regulatory structure to ensure it does not discriminate against energy efficiency and alternative energy technologies.

- Eliminate regulatory barriers to the co-generation of electricity, heating and cooling.

Nuclear Industry

Based upon the initial work of the Subcommittees', the Board's preliminary recommendations are:

- The state should continue to make every effort to ensure that the next-generation commercial uranium enrichment plant is located in Paducah.

- Ensure that the environmental problems at the existing Paducah plant are resolved as efficiently as possible, while ensuring long-term stewardship for cleaning activities.

- Develop educational programs to ensure the availability of an adequately trained workforce to support related nuclear industry in the state.

- Continue support for the Kentucky Consortium for Energy and Environment as it seeks to develop new commercial opportunities associated with the Paducah facilities.

Long-Range Energy Issues

Based upon the initial work of the Subcommittees', the Board's preliminary recommendations are:

- Create an Energy Commission that includes non-governmental representatives to monitor, review and advance regulatory and budget policies affecting the implementation of the state energy policy and programs.

- Maintain the state's position on the Federal Energy Regulatory Commission proposal to redesign the nation's energy transmission system.

- Promote energy education at all levels of the educational system.

- The General Assembly should address the mineral rights ownership issues surrounding the extraction of coal bed methane.

- Continue efforts to find environmentally acceptable and economically viable means to increase the use of Kentucky coal.

A Progress Report -- Accomplishments To Date

Since its creation by the Governor, on May 16, 2001, the Kentucky Energy Policy Advisory Board (KEPAB) has held numerous board meetings, hearing from a variety of experts on the issues of power plant siting and the allocation of nitrogen oxide (NO_x) allowances. The KEPAB created two subcommittees on those issues to make policy recommendations to the Governor.

Successful Siting Legislation

The Siting Subcommittee outlined the criteria that should be included in any legislation on the siting of electric power generation facilities, transmission interconnection and utility asset transfers.

After intense debate in the 2002 General Assembly, Governor Patton signed into law Senate Bill 257, which established criteria for the siting of electric power generating facilities. Senate Bill 257 set specific setback requirements from nursing homes, residential neighborhoods and churches. In addition, Senate Bill 257 requires a siting board review of proposed merchant projects, a Public Service Commission review of proposed regulated utility projects and an assessment of the cumulative environmental impact of any new generation upon the Commonwealth's air, water and land.

Maximizing Value to the Commonwealth: NOx Allowance Allocation

To maximize the value of air emission allowances that the state receives from the U.S. Environmental Protection Agency, under the NOx State Implementation Plan (SIP), the NOx Subcommittee recommended, and Governor Patton agreed, that five percent of Kentucky's total allocation, or the allowance set aside for new generation sources, would be sold on the emissions trading market. This approach was adopted because it did not affect the price of electricity for existing ratepayers.

Proactive Planning for the Future

On May 14, 2002, Governor Patton directed the KEPAB to develop a long-term energy plan for the Commonwealth. Five subcommittees were created: coal, electricity, natural gas and petroleum, energy efficiency and alternative energy, and nuclear energy. A core writing team was established to craft the final plan and refine the information received from stakeholders and the subcommittees. In addition, a team of experts from the University of Kentucky studied the projected energy trends for the next 20 years and their potential impact on Kentucky's energy future. This Interim Report provides the groundwork for the long-term energy policy that will follow and reflects the policy recommendations of the five subcommittees.

Governor Patton Leads a National Discussion On Standard Market Design

Governor Patton's October 2002 conference, "Standard Market Design: A National Discussion with Energy Policy Decision-Makers," was held in response to a controversial 640-page proposed rule from the Federal Energy Regulatory Commission (FERC) to transform the nation's wholesale electric transmission and energy market. The rule is intended to create a power grid operated under uniform national rules by regional

entities. It would reduce the authority of states to regulate their electric transmission systems and would encroach upon the state's authority to regulate electric utility operations.

This successful conference attracted more than 250 executives from the electric utility industry, independent power producers and state leaders from across the country to discuss the effect of the proposed changes, which are intended to further deregulate the wholesale electric power market. Pat Wood III, FERC Chairman, provided the keynote address.

The purpose of the conference was to discuss the impact of the Standard Market Design proposal and to hear all perspectives from the electric industry and regulatory community. The conference resulted in policy recommendations that were sent to FERC outlining issues and recommendations that take into account the unique regional differences of the nation's electric markets.

LONG-TERM ENERGY TRENDS

Kentucky is an energy-rich state, blessed with an abundance of power-producing resources. The promise of this wealth in the ground was recognized by our forefathers, who began developing its commercial potential.

With the development of new technologies and energy related industries, Kentucky's energy resources have an even greater potential today to improve the quality of life for our citizens. This will become a reality only if the state looks beyond its immediate concerns and formulates a strategic plan that meets today's energy needs while ensuring a dependable energy future.

The vitality and viability of Kentucky's economy can be improved through sound energy policies. The Commonwealth can utilize its energy resources in a manner that protects our environment and the quality of life for our citizens, while ensuring that Kentuckians reap the financial benefits of the resources that have influenced the state's economy and culture for centuries. One of the overarching objectives of any long-term energy plan must be an energy sector that supports the economic well-being of the state in the most low-cost, efficient, and environmentally sustainable way.

"*We will take steps to reach beyond a vision and develop a plan that ensures Kentucky's low-cost energy advantage and promotes economic development and the use of Kentucky's largest natural resource while protecting our fragile environment.*" – Governor Paul Patton's charge to the KEPAB in May 2002.

In crafting this report, the KEPAB focused on a specific vision:

> A future for the Commonwealth of Kentucky that unites us in common purpose and builds on the strengths of our heritage and our resources. We see an ongoing commitment to conserve our environmental resources, to build upon our national and international leadership in the energy field, and to create quality educational opportunities to develop interest in energy-related professions and address complex energy issues.

The Board's work also reflects its commitment to certain core values that provided a foundation for its deliberations:

- Reliability – providing a system that ensures quality of service and a sustainable and reliable energy supply.
- Human Health – acknowledging and respecting the critical importance of individual and community health as we balance environmental and energy concerns.
- Research and Development – maximizing research and development dollars so Kentucky can develop environmentally sensitive energy technologies and remain on the cutting edge of energy solutions.
- Education – developing our future work force by realizing the full potential of our human capital.
- Security – keeping our energy resources and infrastructure safe.
- Economic Development – acknowledging that a vibrant economic future requires a sound energy policy.
- Diversity – diversifying Kentucky's energy portfolio to ensure a sound and strategic mix.
- Efficiency – minimizing the cost of energy, both environmentally and economically, while obtaining useful energy services such as light, heat, cooling and transportation.
- Partnerships – developing long-term, mutually-beneficial partnerships among communities, universities, industries and government, all of which are critical to a successful energy strategy for the Commonwealth.

The Process

Building a strong foundation begins with the efforts of many people. Well over 150 individuals holding a variety of perspectives helped create this report. The planning participants included:

- Members of the Kentucky Energy Policy Advisory Board
- Industry representatives

- Environmentalists
- University experts and trends analysts
- Consumers
- Regulators

Following a guiding principle that "all voices will be heard," committees met to assess strengths, weaknesses, opportunities and threats for the energy sector. They identified strategic issues and provided feedback on the draft report. A team of researchers at the University of Kentucky provided a glimpse into the future through their thorough trends analysis. The Advisory Board members provided vision and direction as they compiled the information to draft the report. A core writing team refined the Interim Report into a cohesive foundation, which will be used as a building block for the final long-term energy strategy.

The comprehensive review of Kentucky's energy landscape was conducted by committees that focused on coal, electricity, natural gas and petroleum, energy efficiency and alternative energy, and nuclear energy. The committee's findings established the basis for the Energy Policy Advisory Board's preliminary recommendations on the path Kentucky should travel to ensure a secure energy future.

National Energy Trends and the Potential Impact On the Commonwealth of Kentucky

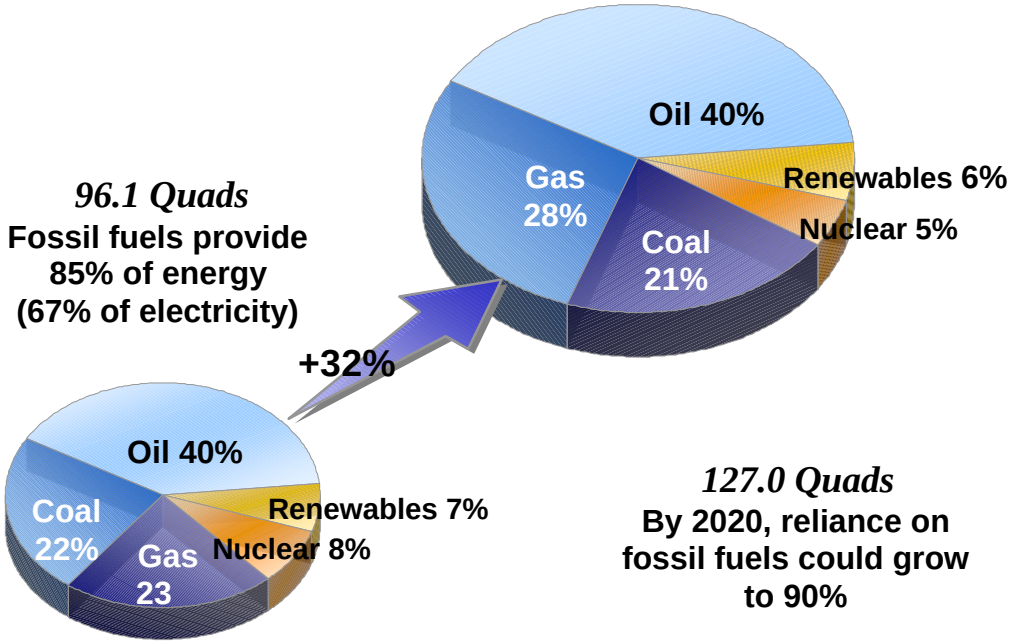
The Governor's charge to the Kentucky Energy Policy Advisory Board was to base a long-term strategy in science and technology. A trends team composed of energy experts from the University of Kentucky was asked to identify domestic trends in the United States for the next 20 years and their potential effect on Kentucky and its energy sector.

Three forces will shape the future of the energy industry:

- Regulation/Deregulation
- Environmental Performance
- Technology Innovation

National Trends

The United States used 96.1 quadrillion BTUs, or quads, of energy in 1999, and domestic energy consumption is expected to increase by 32 percent by the year 2020. Of the total U.S. consumption, 72 quads are produced domestically; the rest are imported.



It is important to note that any future national energy policies or legislation that may be implemented will impact domestic energy trends. Innovative public policy or reactions to a crisis may also impact national energy trends. Some analysts believe that the United States' reliance on fossil fuels is expected to increase from eighty-five percent to ninety percent by 2020. Based upon current data, which represents a "snap shot in time", the nation's reliance on renewable energy is expected to remain stable or increase slightly. Nuclear energy consumption will decrease by three percent during the same period, the result of an aging nuclear production system. Natural gas consumption will increase by five percent, from twenty-three to twenty-eight percent. As a result, liquid natural gas imports will increase, expanding U.S. dependence on foreign energy sources.

Units of energy are commonly measured in British Thermal Units, or Btus. A 60-watt light bulb uses 205 BTUs of energy every hour. Amounts of energy are written in quadrillions of BTUs. One quad is the equivalent of 10^{15} BTUs.

Energy in Kentucky

Kentucky is the third-largest coal producer in the nation, behind Wyoming and West Virginia, producing approximately 134 million tons a year. That is equivalent to 3.4 quads of energy. A net exporter of coal, Kentuckians use about 20 million of the total tons produced in the state. Kentucky is a net importer of oil and natural gas.

Kentucky consumes about 2 percent of the energy in the United States. It is a larger industrial user, on average, due to the aluminum and auto manufacturing industries and the nuclear gaseous diffusion plant in Western Kentucky. The commercial sector uses a smaller fraction of Kentucky's total energy than the average state in the United States.

Kentucky Oil and Natural Gas

The long-term availability and affordability of natural gas remains an issue in Kentucky and the United States as a whole. With only two refineries in the state, Kentucky produces 2.1 percent of the oil it uses and more than 40 percent of the natural gas needed. The state is also at the crossroads of natural gas transmission lines and has access to large amounts of natural gas flowing through the state.

Although the reserves of coal bed methane in Kentucky have yet to be quantified, they are believed to be significant. The actual potential will be revealed only by drilling and coring coal beds to retrieve methane desorption data. Currently, Kentucky, Indiana and Illinois are proposing a collaborative study to determine the potential for commercial coal bed methane reserves in the Illinois basin.

Another, yet poorly assessed, reserve is natural gas in the deep sedimentary basins of Kentucky. To date, average oil and gas wells drill to less than 3,000 feet; the deep sedimentary basins extend downward as much as 30,000 feet and this entire thickness is likely prospective.

Kentucky also has considerable tar sand deposits that could become important in the future if the price of oil increases significantly.

Critical Trends in the Coal Industry

In the short-term, there is a need for affordable environmental-control technologies to reduce air pollutants from existing coal-fired power plants.

The mid-term trend will be toward cleaner, more efficient power-generating options for new coal and natural gas plants. This will involve advanced pulverized, fluidized bed combustion technologies, integrated combined cycle gasification and distributed generation.

In the long-term, we will move toward near-zero emissions from high efficiency coal and natural gas plants with low-cost carbon sequestration as a component, in addition to widespread use of fuel cells. To reach this target of near-zero emissions, we will need to quantify the energy sector's contribution to CO2 loading in Kentucky. In addition, we will have to develop low-cost and effective carbon sequestration strategies that include advanced separation, capture, and storage technologies, as well as enhancements to natural processes.

Carbon management options should include conservation initiatives that reduce the overall demand for energy, utilization of carbon-free or lower carbon fuels, and removal of CO2 through carbon sequestration technologies. Reduction of CO2 can only be accomplished by two mechanisms -- reducing the rate by which it is released into the atmosphere and increasing the rate by which it is removed from the atmosphere.

Biomass in Kentucky

The reliance on ethanol, a corn-based fuel, is increasing in the United States. Kentucky produces only 0.15 percent of the national total. A plant that is planned for Hopkinsville, Kentucky would produce 20 million gallons per year for use by the transportation sector.

Additional biomass materials such as sawdust, energy crops, biodiesel fuels and agricultural-based chemical feed stocks are also a part of Kentucky’s biomass industries.

Coal and Electricity Trends in Kentucky

Kentucky can maintain its low-cost energy advantage by focusing on the subject areas:

- Coal prices must remain relatively stable to maintain Kentucky's low-cost energy status.
- Market-based air emissions trading should continue to facilitate cost-effective coal combustion options.
- Regulated utilities continue to provide a large, stable, reliable, and low-cost base load supply of electricity for Kentucky customers and industries.
- More stringent Clean Air Act standards must be managed by advances in technology or by other means if coal-fired power plants are to remain cost effective.

Nuclear Industry

The U.S. Enrichment Corporation (USEC) announced that it will site its Lead Cascade centrifuge uranium enrichment test facility at its Portsmouth, Ohio plant in Piketon, Ohio. Operation of this advanced technology facility will demonstrate USEC enhancements to the U.S. Department of Energy's proven centrifuge uranium enrichment technology, which is expected to be the world's most efficient process for enriching uranium for nuclear fuel. USEC underscored the continuing importance of its Paducah, Kentucky enrichment facility as a long-term asset for both its business and for the nation.

Both states provided strong incentive packages. Excellent community support existed in both locations. However, cost and schedule were the key factors in the decision. Siting the lead cascade facility at the Portsmouth facility makes use of existing buildings, which reduces costs and saves time. USEC will make a decision on the siting of the commercial plant in 2004. Kentucky will compete for the commercial plant location.

Environmental Performance

At both the national and state level, an even closer link will develop between the energy sector and the environment, affecting the extraction, production, combustion and distribution of fossil fuels.

Conservation

The University of Kentucky Trends team reported that conservation efforts at the national and state levels have the potential to decrease energy utilization and demand. However, conservation efforts may have a limited long-term impact unless coupled with energy efficiency improvements and incentives such as state and federal tax credits and reductions.

Advanced Technology

Major federal and state incentives are needed for research and development into the potential of deep fossil fuels (especially natural gas reserves), the advanced extraction, combustion and distribution technologies for fossil fuels and alternative energy technologies.

There is a lag between research and development and the time that technology becomes commercially available and affordable for use by Kentucky customers and industries.

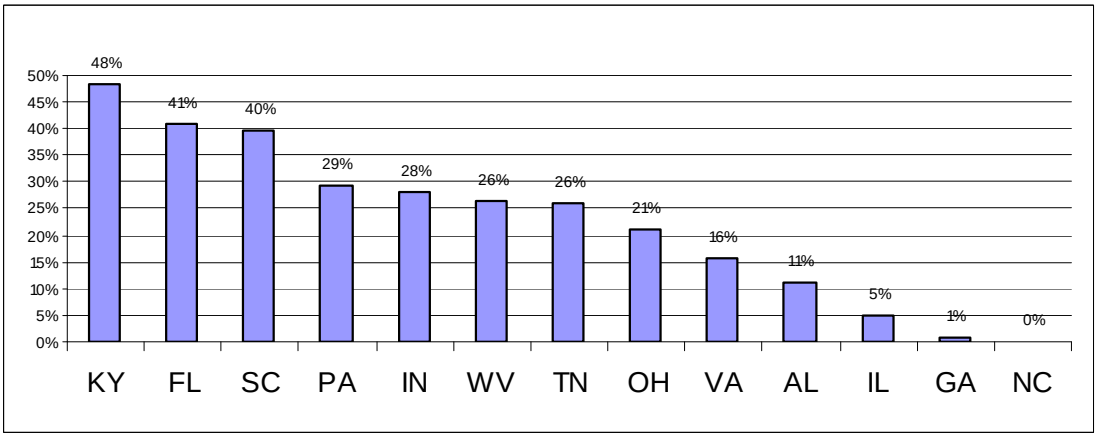
SUBCOMMITTEE REPORTS

Below are synopses of the various subcommittee reports. This report endeavors to present the essential issues that were discussed and fairly reflect the committees' deliberations.

Coal Subcommittee

Coal is used by the state's electric utility industry to generate 97 percent of the electricity produced in the Commonwealth. Utilities in Kentucky have installed more Flue Gas Desulfurization equipment on their operating power plants than any other state in the Eastern United States. This commitment to air pollution control technology has enabled the state's utilities to continue to burn high-sulfur coals. However, the coal industry has changed dramatically in the state, even with the reliance on coal to produce the majority of the state's electricity. (See chart below.)

Power Plant Capacity Equipped with FGD in Selected Eastern U.S. States



Source: (Electric Power Annual 1999 Vol. II)

Small coal producers have left the market and are unlikely to return unless financial incentives are made available. They have been replaced by large companies with coal holdings of various qualities and quantities in multiple states and countries. Fifteen coal companies control 71 percent of the coal mined in the United States; the top three control 35 percent. Each company has developed its business plan based upon its ownership of coal reserves and the likelihood of environmental and regulatory change in both the extraction and the combustion of the product they mine. (See chart below.)

15 Largest U.S. Coal Producers

Tons (000) Produced in 2001

Company	Western Low Sulfur	Eastern & Mid-Cont (excludes Ill-Basin and KY)	Illinois Basin	Western KY	Eastern KY	Total Tons (000)	Cumulative Percent of Total
Peabody Group	125,630	14,666	20,003	7,746	---	168,045	15%
Arch Coal	86,154	27,493	---	---	2,814	116,461	25%
Kennecott Energy & Coal	110,548	---	---	---	---	110,548	35%
Consol Energy	---	63,254	1,951	---	5,675	70,880	41%
RAG	44,290	19,378	1,463	---	---	65,131	47%
Horizon Natural Resources	5,389	13,820	8,950	---	19,300	47,459	51%
Vulcan Partners	43,049	---	---	---	---	43,049	55%
A.T. Massey Coal	---	33,815	---	---	11,001	44,816	59%
North American Coal	23,480	3,248	---	---	---	26,728	62%
TXU Corporation	---	22,814	---	---	---	22,814	64%
Westmoreland Mining	14,666	7,386	---	---	---	22,052	66%
Robert Murray	---	8,697	7,009	2,278	---	17,984	67%
Alliance Coal	---	2,684	3,555	8,569	2,936	17,744	69%
Pittsburg & Midway Coal	11,302	3,230	---	---	---	14,532	70%
BHP Minerals	15,643	---	---	---	---	15,643	71%
Top 15 Total	**480,251**	**220,485**	**42,931**	**18,493**	**41,726**	**803,886**	
U.S. Total	**546,366**	**349,725**	**96,558**	**25,477**	**108,304**	**1,126,430**	

SOURCE: RDI COALdat November 2002 (Data revised periodically)

A new reality is emerging in the market place. Productivity, transportation costs and environmental regulation have fundamentally altered the way coal is priced and sold. Western Kentucky's coal market is limited to those generators who have installed flue gas desulfurization equipment, also known as scrubbers. Eastern compliance coal and Powder River Basin coal, which are low in sulfur, supply a significant part of the market share of the unscrubbed coal-fired generation.

Kentucky produced almost 134 million tons of coal in 2001, approximately 25 million tons in Western Kentucky and 109 million tons in Eastern Kentucky. The top 10 Kentucky coal producers are typical of the large multi-state coal companies. They have holdings and extractive operations in multiple coal fields across the United States.

Top 10 Coal Producers in Kentucky
Tons Produced in 2001 by State (000's)

Mine Controlling Co.	KY	TN	VA	WV	CO	IL	WY	IN	MD	UT	OH	PA	AZ	NM	MT	Total
A.T. Massey Coal	11,001		552	33,263												44,816
Horizon Natural Resources	19,300			13,820	5,389	4,709		4,241								47,459
AEP KY Coal	6,399															6,399
Alliance Coal	11,505					1,889		1,666	2,684							17,744
Consol Energy	5,675		7,051	23,660		1,951					5,414	27,129				70,880
Cumberland Resources	3,491		1,814													5,305
James River Coal	10,360															10,360
Lodestar Energy	5,226			335	323					537						6,421
Peabody Group	7,746			14,666	1,706	1,033	101,873	18,970					13,418	6,041	2,592	168,045
TECO Energy	5,109	261	411													5,781
Totals	**85,812**	**261**	**9,828**	**85,744**	**7,418**	**9,582**	**101,873**	**24,877**	**2,684**	**537**	**5,414**	**27,129**	**13,418**	**6,041**	**2,592**	**383,210**

Source: RDI COALdat

The market for Western Kentucky's coal lies principally in 3 states: Kentucky, Tennessee and Florida. Eastern Kentucky coal currently enjoys a market share in 12 states.

Markets for Coal Produced in Kentucky – 2001				
Plant Operator	**Western KY**	**Eastern KY**	**Total Tons (000)**	**Cumulative Percent of Total**
Tennessee Valley Authority	14,073	6,163	20,236	18%
Georgia Power Co.	---	15,115	15,115	31%
LG&E Energy	9,628	2,884	12,512	43%
Duke Energy Corp.	---	7,551	7,551	49%
South Carolina Public Service Authority	---	7,548	7,548	56%
Carolina Power & Light Co.	---	5,212	5,212	61%
Cincinnati Gas & Electric Co.	8	3,464	3,472	64%
Dominion Virginia Power	---	3,182	3,182	67%
Kentucky Power Co.	---	3,048	3,048	69%
South Carolina Electric & Gas Co.	---	3,015	3,015	72%
Florida Power Corp.	---	2,944	2,944	75%
East KY Power Coop, Inc.	---	2,849	2,849	77%
Detroit Edison Co.	---	2,771	2,771	80%
Orlando Utilities Comm.	---	2,544	2,544	82%
Seminole Electric Coop, Inc.	2,049	245	2,294	84%
Dayton Power & Light Co.	---	2,258	2,258	86%
South Carolina Generating Co., Inc.	---	1,579	1,579	87%
Tampa Electric Co.	998	379	1,377	89%
Sub Total	**26,756**	**72,751**	**99,507**	
Total KY Market	**28,205**	**84,228**	**112,433**	
Source: RDI COALdat				

Challenges & Opportunities

The use of electric power is projected to steadily increase over the next decade, a situation that could result in a greater use of coal.

- The uncertainty of the timing and extent of environmental requirements and permitting processes for coal-fired power plants on both the national and state levels presents a serious obstacle to future development.
- Opposition to growth expressed by some groups must be addressed, as must concerns about environmental issues such as air quality, water use, and the disposal of coal combustion by-products.
- Opportunities would be enhanced with a national environmental policy that promotes domestic coal production and use.
- Environmental regulations that encourage scrubbing by lowering the SO2 emission rate at which SO2 credits are allocated under the Acid Deposition Control Program could address Kentucky's loss of market share in the electric

generation industry by providing an opportunity for Kentucky's high-sulfur coals to be further utilized across the country.

Electricity Subcommittee

Change has marked the electricity industry for much of the past decade. Since the passage of the Energy Policy Act of 1992, as many as 26 states have investigated the possibility of deregulating utilities to allow for customer choice of suppliers in the retail market. Many other states, including Kentucky, have opted to maintain a regulated retail market. Only 15 states have completely deregulated their retail markets to date.

Kentucky enjoys the lowest cost electricity in the nation at approximately 4.1 cents per kilowatt hour on average. Kentucky's access to coal and the imbedded costs of existing power generating facilities keep the state's electricity rates low. Northern and Northeastern states rely more and more on expensive nuclear power and natural gas - and it is reflected in the higher rates their customers pay.

The electricity subcommittee identified several major issues that affect the industry:

- Education emerged as an overriding theme. The public, policy-makers, and legislators need to know more about the reasons behind Kentucky's historic low-cost power. Other areas where more education is needed include environmental issues such as siting, fuel choice, cleaner coal-fired generation alternatives and costs, and trends in the industry, such as distributed generation and fuel cells.

- Infrastructure in Kentucky's electricity sector continues to be a controversial subject. The impacts of Standard Market Design on energy intensive industries, the rates that individual consumers pay, and future economic development remain in question. Who pays and who benefits from transmission lines has yet to be defined or fully discussed. Kentucky supports a robust wholesale electricity market and also promotes the "coal-by-wire" concept. Coal-by-wire means burning Kentucky coal in the state and transporting the electricity to other consumers in neighboring states. Kentucky would incur the costs of externalities, including the pollution costs of coal-by- wire power generation. It is fully expected that those entities and customers who benefit from the electricity generated and sent to other states will pay the cost of Kentucky's new transmission infrastructure.

Coal-by-wire means burning Kentucky coal in the state and transporting the electricity to other consumers in neighboring states

- The attacks on September 11, 2001 and the continuing threat of terrorism requires a new focus and emphasis on the issues of energy efficiency and distributed generation as potential methods to further reduce system vulnerability to disasters or terrorism. The energy industry and policy makers must continue to coordinate efforts and improve security systems to protect the electricity infrastructure and resources in the Commonwealth. Energy policies should be reviewed and coordinated with the state's emergency operations centers.

- Additionally, the issues of through-and-out transmission, curtailment, as well as how to maintain and expand Kentucky's coal industry, were priority items to be further expanded upon in the implementation plan.

- Another broad category encompassed regulatory issues involving federal and state roles in the electric utility industry and the current tension between those two jurisdictions. The transition of the market and potential deregulation of the retail market are major issues. Kentucky's ability to maintain strong state regulatory oversight and cost-based retail rates will continue to be important in maintaining Kentucky's low electric rates for consumers.

- Costs and environmental compliance issues require a balanced energy policy that takes into account the cost and benefits of each potential path forward. Environmental Protection continues to be a major concern. Beyond siting, fuel choices, clean coal-fired generation technologies and the timing and extent of future environmental standards are creating uncertainty for the industry. Cost is another major theme, and cost-based retail rates are important for Kentucky. Other cost issues include who pays for upgrades necessary to ensure the safety and reliability of the system, while minimizing increased costs to consumers.

- Economic development is an important consideration for Kentucky and for to the electric industry. Kentucky will continue to promote the coal-by-wire concept and the use of Kentucky coal. Future development of electricity generation and transmission capacity will have an impact on economic development, both in terms of available capacity and the potential for large industries to locate in the state. Low-cost power currently gives Kentucky a competitive advantage and is a long-term economic development tool for the state that translates into jobs and a higher standard of living for Kentuckians.

- Research and development (R&D) is critical to the success of the electricity industry. R&D issues include environmental considerations, advanced generation technologies, trends such as distributed generation and fuel cells, and the need for information to support state and federal policies.

- Collaboration among the stakeholders in the electricity industry will be an important issue as federal policy makers continue to focus on regional and national markets. Collaboration encompasses issues such as consumer

protection and the efforts of regional governors' organizations to influence policy - particularly with Governor Patton in the National Governors Association leadership position.

Challenges & Opportunities

Several issues may have an impact on Kentucky's electricity industry and the low-cost advantage it offers the state for economic development and individual, residential, commercial and industrial customers.

- There is a great deal of uncertainty in the industry today, much of it created by a federal-state conflict on how to approach restructuring and define national transmission policy.
- The redesign advocated by the Federal Energy Regulatory Commission (FERC) conflicts with Kentucky's interests. The full impact of the proposed changes is still uncertain. Initial concerns include the likelihood of increased transmission costs to be borne by Kentucky's electric customers, jurisdictional matters, and the loss of local control over many aspects of electricity planning and reliability. There exists the very real possibility, and indeed likelihood if FERC prevails, that Kentucky electric consumers will be required to pay the costs of constructing and upgrading transmission systems for which Kentuckians may receive limited benefits.
- The potential cost of complying with environmental regulations related to the use of coal could mean higher electric bills for utility customers. The lack of fuel diversity also leaves the Commonwealth vulnerable to coal-price fluctuations, although coal as a fuel is less subject to volatility than other fossil fuels.
- The state's electric transmission capacity is adequate to serve Kentucky customers, but is not large enough to support wholesale power transfers that traverse the state.
- Kentucky's central location, abundant natural resources, established electric generation and transmission system, and access to an adequate rail and barge transportation system have the potential to make Kentucky a leader in the national energy arena.
- While Kentucky understands the benefits of coal-by-wire will vary based upon the volume of out-of-state sales, weather patterns, fuel prices, system configurations and other considerations, the committee felt it inappropriate to support socialization of the costs of new or upgraded transmission lines not needed by Kentucky customers. Rather, they felt that those electric customers who receive the ultimate benefit should bear this financial burden.
- Governor Paul Patton's term as chair of the National Governors Association (NGA), and his emphasis on energy initiatives, offers another significant opportunity for Kentucky. He has the opportunity to affect long-term and far-reaching energy policy during his tenure. It is essential that Kentucky's future leadership have sustained participation and visibility regarding the NGA's energy initiatives and policies.

Natural Gas and Petroleum Subcommittee

The natural gas and petroleum industry in Kentucky serves the needs of the citizens of the Commonwealth with adequate, safe and reliable supplies of natural gas and petroleum products at competitive prices.

Most of the natural gas and petroleum products consumed in Kentucky are delivered by one of eight major interstate pipelines delivering gas from the Gulf of Mexico region. Some 200 local distribution companies, primarily investor-owned utilities and municipalities, deliver almost one quadrillion British Thermal Units (BTU) of natural gas to residential, commercial and industrial consumers.

Twenty-four intrastate pipelines deliver natural gas from local wells and gathering systems as a supplement to the delivery of pipeline gas. Twenty-nine natural gas storage fields provide a physical, if not financial, hedge during the winter season. Less than ten percent of the natural gas and petroleum products used in the state are produced in Kentucky. The Commonwealth is a net importer of natural gas and petroleum. Fortunately, Kentucky is adequately served due to its location midway along "pipeline alley," the corridor from the Gulf to the population centers of the Northeast and Upper Midwest.

Kentucky is blessed with extensive fossil fuel deposits. In addition to Kentucky's current proven reserves of natural gas, the Commonwealth has additional untapped reserves of natural gas resources in the form of shallow gas coal bed methane, Devonian Shale gas and, deep formation gas potential. Shallow sources also include the Mississippian limestone and Corniferous units.

Kentucky also has access to potentially substantial natural gas in the form of coal bed methane. This resource base represents a significant supplemental supply of shallow natural gas for Kentucky in the future *if* it can be economically recovered and delivered to market at a competitive price. Additional deep reserves are in the Cambrian rocks of Kentucky's two deep sedimentary basins that have remained largely unexplored and that represent significant future potential. In addition, even deeper Precambrian rocks in central Kentucky have been shown to be largely sedimentary, making them prospective from natural gas exploration. Highly productive, but elusive Trenton-Black River gas production in New York and West Virginia may also be present in the deep subsurface of Kentucky.

Tapping into Kentucky's natural gas and petroleum resources also represents an excellent opportunity to further develop Kentucky's extractive energy industry and employment base. To the extent that environmental and political constraints limit the expansion of natural gas production and capacity in and from other regions of the country, this largely untapped resource base may become an increasingly valuable source of energy for Kentucky.

At present, Kentucky's local producers have little incentive to develop these resources. Investment in new drilling technology presents a serious capital recovery problem because it is economically driven. Local gas distributors primarily rely upon more economical gas supplies piped in from outside the state to meet demand. Local producers play a relatively small role in Kentucky's current supply picture.

Where coal bed methane could be a supplemental source of supply now, ongoing disputes between holders of natural gas and coal mineral rights, together with a lack of publicly available data methane content date, have discouraged any significant development of this resource. More coal bed methane is released into the atmosphere, unutilized, in Kentucky than is recovered for energy supply purposes.

Most natural gas consumed in Kentucky is for heating homes and businesses, followed closely by the use of natural gas for fueling industrial processes. Increasingly, natural gas in Kentucky and throughout the nation is also being used to fuel the generation of electricity at highly efficient peaking plants that complement the use of Kentucky's coal and hydropower electric generating facilities. Natural gas used for generating power is the fastest growing segment of the industry. During the fall and winter of 2000-01, lack of adequate exploration and production activity combined with a higher demand for natural gas for power generation and additional requirements for home heating led to a temporary demand and supply imbalance both nationally and Kentucky, resulting in price spikes and undermining the gas affordability to traditional markets.

As a net importer of gas, Kentucky is not immune from the volatility of national energy markets, especially the wholesale market for natural gas. Unlike electricity, which is mostly generated from regionally mined coal, consumers of natural gas in the Commonwealth must compete for their share of the nation's natural gas pie. Periods of constrained supply may occur due to increased use of gas for power generation, industrial consumption, sustained cold or hot weather, pipeline disruptions or a combination of these and other factors. If so, Kentucky residential and industrial users will find their local utilities selling gas at higher retail prices as a result of wholesale price rationing by producers and marketers in other regions of the country. Since the winter of 2000-01, the average price of wellhead natural gas has been reset closer to $3.00 - $3.50 or more per thousand cubic feet (Mcf) versus $2.00-$2.50 per Mcf during the preceding decade. While one of the most economical and cleanest-burning energy sources, growth in natural gas usage is largely limited to the power generation and industrial segments of the market. Natural gas use per household in Kentucky has consistently declined, since the mid-1980s, due to more energy efficient homes and appliances, and changing lifestyles. The relative increase in natural gas prices further discourages consumption.

Obviously, Kentucky, with its strong industrial sector and modest personal incomes, benefits from having healthy competition between energy sources. To maximize this, the Commonwealth should do everything it can to encourage domestic exploration and development of natural gas resources in Kentucky, including natural gas storage. Natural gas exploration and production is encouraged by the recent cost-free, online availability of oil and gas records at the Kentucky Geological Survey, the first of its kind in the country. Additional natural gas exploration and production could be encouraged by further research and development of the commercial potential for coal bed methane, Trenton-Black River dolomite reservoirs, and deep basin gas resources in the commonwealth.

Natural gas storage provides a unique opportunity to increase the supply of gas available to Kentucky during peak and non-peak periods. The Kentucky Geological Survey conservatively estimates that Kentucky can double the number and capacity of working gas storage fields through the re-development of depleted natural gas reservoirs within fifteen miles of existing pipeline facilities. Increased natural gas storage capability can reduce the need for additional interstate pipeline development in Kentucky and avoid siting conflicts for pipelines and the resulting cost recovery from consumers. Increased storage can also help maximize utilization of expensive interstate pipeline capacity for investor-owned and municipal gas systems. Finally, more gas storage in Kentucky can help flatten out seasonal price curves and lead to more stable natural gas prices.

Opposition in local communities to pipeline and other energy projects can prevent needed development. An ongoing challenge will be the necessity of balancing property owner rights and environmental concerns with the necessity of locating energy sources and delivering them to market. Yet Kentucky needs these fuels to provide energy to heat homes, fuel industry and grow employment.

It is important that our flagship educational institutions continue to attract and educate new geologists and petroleum engineers in support of this goal, and that a sufficient number of these future energy experts remain in the state to help develop Kentucky's energy sources of tomorrow.

Challenges and Opportunities

The committee identified the following areas as meriting closer review:

- The increased use of gas for power generation, combined with heavy use for home heating, could lead to an imbalance in supply and demand that could result in price increases.
- As a net importer of gas, Kentucky is subject to the volatility of the national natural gas market. Natural gas storage provides an opportunity to increase the gas supply available to Kentucky during both peak and non-peak periods and to cushion customers from dramatic price fluctuation. The Kentucky Geological Survey estimates that the state can double the number and capacity of working gas storage fields by redeveloping depleted wells within 15 miles of pipeline facilities.
- Policies that encourage increased exploration for and discovery of additional natural gas resources within the state could help even out the volatility in the gas market for Kentuckians.
- There is a need for post-secondary educational institutions to attract and educate new geologists and petroleum engineers and for these experts to be encouraged to remain in Kentucky.

Energy Efficiency and Alternative Energy Subcommittee

The potential contribution of energy efficiency and alternative energy to Kentucky's energy future is large and relatively untapped. There are significant cost-effective gains that could be made by improving our energy efficiency. However, these improvements are impeded by Kentucky's low electric costs and major, long-standing market barriers. These barriers include the lack of information among all the participants in the marketplace, split incentives and a fragmented design process.

The lack of information prevents consumers, owners, decision-makers and designers from making use of the most cost-effective energy technologies and design methods that are available. Split incentives result from divergent goals. For example, builders focus on minimizing construction costs and meeting their schedules, but pay little or no attention to long-term energy costs that the owners of the building will be left to pay.

Current design processes are non-integrated, which leads to fragmentation. Specialists work in isolation from each other, when they could be working together as a team in order to optimize the performance of the building as a whole system. The state's present regulatory structure compensates utility companies with higher revenues and profits when they maximize their energy sales. This naturally reduces their incentive to aggressively pursue efficiency options with their industrial, commercial and residential customers.

Challenges & Opportunities

A major challenge facing energy efficiency and alternative energy in Kentucky is to achieve a level playing field that will allow them to be compared on an equal economic and engineering basis with other energy sources. There also are longstanding market barriers to significant, cost-effective improvement in energy efficiency. These include:

- A lack of information in the marketplace.
- A lack of value assigned in the marketplace to the environmental advantages of energy efficiency and alternative energy.
- Split incentives that reflect competing goals (such as a builder focusing on minimizing construction costs without paying attention to a building's long-term energy costs).
- A fragmented design process that finds specialists working in isolation from one another instead of together to improve the overall energy performance of a building.
- A utility rate structure that does not always reward and encourage energy efficiency. Generally, utilities are rewarded with higher revenues when sales increase, understandably reducing their incentive to pursue efficiency programs.

Technologies that promote energy efficiency and alternative energy offer significant opportunities for the state include:

- Diversify Kentucky's energy supply, leading to reduced risks from possible price increases and environmental regulations.
- Increase economic efficiency by reducing energy costs.
- Improve environmental quality.
- Increase resiliency and reliability for electricity transmission grids during periods of peak usage.

- Benefits beyond lower energy costs for better-designed buildings and industrial processes include improved productivity and product quality, as well as higher retail sales.
- Stronger partnerships among public and private entities to build on Kentucky's research, development and demonstration strengths.
- Improved education that enables all consumers to choose energy options that minimize long-term energy and environmental costs.

Nuclear Subcommittee

Currently, there are approximately 400 licensed radiological facilities in Kentucky (e.g. hospitals, research labs) that generate low-level radiological wastes. The materials used in these facilities come from various medical and research providers. Radiological wastes must be disposed of at certified facilities. The Commonwealth of Kentucky has no licensed facilities for disposal of such waste. All wastes must be transported out of state.

Kentucky statute (KRS 278.605) prohibits the construction of nuclear power generation until the Federal Government approves disposal of high level nuclear waste. Yucca Mountain High Level Waste Depository has been approved. However, Kentucky's two nuclear facilities are low-level nuclear waste facilities located at Maxey Flats in Fleming County, and at Uranium Gaseous Diffusion Plant in Paducah, Kentucky. The waste, at both Paducah and Maxey Flats, does not fall under the restriction of KRS 278.600, KRS 278.605 or KRS 278.610. The waste at these two facilities is not classified as "high level nuclear waste or spent fuel."

The Maxey Flats facility was opened in May 1963, under a lease arrangement between the Commonwealth of Kentucky and the Nuclear Engineering Company (now U.S. Ecology, Inc.) of Louisville, Kentucky, in January 1963. The site contains short and long-lived radionuclides brought to the site from research laboratories, electric utilities, government and private health-care facilities, manufacturing companies, federal agencies (i.e. DOE, Nuclear Navy, etc.) and nuclear power plants throughout the United States. The radioactive waste was buried in fifty-one trenches measuring up to 650 feet long, seventy feet wide, and thirty feet deep. A total of 142,500 cubic meters

(186,675 cubic yards) of radioactive waste is estimated to have been buried at the Maxey Flats site.

U.S. Ecology, Inc. operated Maxey Flats until commercial operations were terminated in 1977. In 1986, the U.S. Environmental Protection Agency notified 832 potentially responsible parties, including the U.S. Department of Energy, that Maxey Flats had been placed on the Superfund National Priorities List. These parties included other federal agencies, federal contractors, medical facilities, physicians, clinics, industries, state agencies, transporters, broker/haulers, and the land owner. A Remedial Investigation/Feasibility Study was completed in 1991, and the U.S. EPA issued the Record of Decision on September 30, 1991. The Cabinet for Health Services licenses the facility with the Natural Resources and Environmental Protection Cabinet as the licensee. The initial remedial phase of the clean up activities at the site is expected to be completed by 2003.

The Paducah Uranium Gaseous Diffusion Plant was constructed in 1952 and operated by U.S. Department of Energy (DOE) from its initial construction until 1993. On July 1, 1993, the United States Enrichment Corporation (USEC), a government-owned corporation formed by the Energy Policy Act of 1992, assumed operations at the plant. USEC was converted to an entirely privately owned company in 1998. In 1988, the Radiation Health and Toxic Agents Branch (RHTAB) of the Cabinet for Health Services discovered Technetium-99 (^{99}Tc) in private drinking-wells northwest of the Paducah Gaseous Diffusion Plant (PGDP). ^{99}Tc is a product of reprocessed reactor material. Since the plant is the only facility in Western Kentucky that manages ^{99}Tc, it was apparent that the plant was the contamination source. These findings led the USEPA and the U.S. DOE to enter a formal agreement called an Administrative Consent Order (ACO). This order was filed under Section 104 and 106 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), which requires DOE to investigate and study the extent of the contamination.

On May 13, 1991, the Commonwealth of Kentucky and the DOE signed a formal non-regulatory agreement known as the Agreement in Principle (AIP). The DOE initiated these types of agreements with the states. It was the intent of DOE that the additional oversight would ease some of the distrust of the DOE and educate the general public and local and state governments. The Commonwealth's fundamental goal for the AIP was to maintain an independent, impartial, and qualified assessment of the environmental impacts of the past, present, and future DOE activities at the PGDP.

On August 19, 1991, Kentucky issued a Resource Conservation Recovery Act (RCRA) permit for the PGDP for the treatment and storage of hazardous wastes. This permit requires DOE to comply with environmental laws and regulations in the management of hazardous wastes, worker safety, record keeping, emergency planning and prevention, safe storage, and the overall protection of public health and the environment.

On May 31, 1994, the PDGP was placed on the USEPA Superfund National Priorities List (NPL). The NPL is a list of contaminated sites across the nation that has been designated by the USEPA as high priority due to actual or potential threats to human health and the environment. When federal sites are listed on the NPL, federal Superfund law requires those agencies to enter into an agreement that outlines the roles and responsibilities of the parties for investigation and corrective measures. Consequently, a federal agreement known as a Federal Facilities Agreement (FFA) was required for the PGDP. The FFA program, which was not finalized and signed until 1998, is intended to integrate and implement the state and federal clean-up requirements into an effective and comprehensive process. The current clean-up plan for the site is expected to take a minimum of fifteen years at a cost of approximately $2 billion. A current proposal by DOE would seek to accelerate the clean-up with a target date of 2010.

In 1999, 104 nuclear reactors were licensed to operate in thirty-one states. The electricity produced by these facilities accounted for approximately twenty percent of the total U.S. electric generation. Since 1989, nuclear electric generation has increased by forty-three percent through increasing the production of existing facilities. The PGDP facility is currently the only uranium enrichment plant in operation in the United States. In addition to providing enriched uranium for use in nuclear reactors in the United States, it also provides enriched uranium for some foreign plants. The plant is also the largest electric user in Kentucky, with annual electric expenditures of approximately $250 million.

The plant employs about 1300 people with a total payroll in excess of $100 million. This constitutes thirty-two percent of the McCracken County manufacturing work force and fifty-three percent of the McCracken County manufacturing payroll. In addition, approximately 600 people are employed in environmental clean-up activities at the site. A work force reduction of 200 employees was announced in November of 2002.

The Paducah Gaseous Diffusion Plant is out-of-date and is scheduled for closure or replacement by 2010. USEC is pursuing the development and installation of a second-generation centrifuge technology by 2010. The lead cascade pilot project was awarded to Portsmouth, Ohio. However, the site for the commercial facility, a $1 billion development, is yet to be determined. This project would use approximately 90 percent less electricity than the current gaseous diffusion technology and employ approximately 600 people.

As part of the enrichment process, approximately 40,000 cylinders, each weighing ten metric tons, of depleted uranium hexa-fluoride have been generated over the last fifty years and are currently stored on site. An additional 20,000 cylinders are stored at the Portsmouth facility, while approximately 5,000 cylinders are stored at Oak Ridge. The Department of Energy has recently approved a plan to build two separate facilities, one at Paducah and one at Portsmouth, Ohio, to convert the contents of the cylinders into uranium and fluoride production streams.

Challenges & Opportunities

Overall, the domestic market for enriched uranium faces several challenges. First, according to the United States Nuclear Regulatory Commission, only two new nuclear reactors have been brought on line in the last 10 years in this country. Thus the current market appears fairly stagnant. Second, domestic production of uranium faces significant international competition from COGEMA (French Consortium) and URENCO (European Consortium), although it is recognized that there will always be a need for a U.S. enrichment facility for purposes of national security. Beyond these national issues, the future of uranium enrichment at Paducah is threatened by lingering environmental problems and competition from the state of Ohio for the second-generation commercial enrichment plant.

Despite these challenges, there remain strong opportunities for Kentucky to continue to play a significant role in the domestic enrichment of uranium.

Although the nuclear industry has seen little expansion during the last 30 years, recent developments provide some indication that this trend may change over the next several decades. These developments include:

- The decision to build the Yucca Mountain storage facility,
- The potential passage of a national energy bill with an increased focus on nuclear energy,
- Increased pressures to improve air quality, and
- The potential construction of smaller, cheaper, and safer third generation nuclear power plants.

- The U.S. Department of Energy has proposed an accelerated clean-up plan for the PGDP that holds the promise of more funding and an accelerated clean up of the major remaining environmental issues.

- Kentucky has a highly skilled and experienced work force in Paducah that can provide the needed expertise and talent to operate the proposed second-generation enrichment facility.

- The state has established the Kentucky Consortium on Energy and Environment for the purpose of developing new commercial enterprises associated with energy and environmental opportunities. The enrichment plan

(and associated environmental problems), the planned DUF6 conversion plant, and a potential new enrichment plant, all provide significant opportunities for the consortium to serve as an incubator for these new enterprises.

The Commonwealth's Interim Report

The Kentucky Energy Policy Advisory Board has met ten times over the last year. Its sub-committees have met an additional ten times. The result of this series of meetings has been the development of an Interim Report that acknowledges the correlation between costs, reliability, economic development, and the environment. After carefully evaluating all of these areas, the Board believes a series of specific items must be included for Kentucky's future energy policy to be successfully developed.

This report is being written against the backdrop of severe economic dislocation within the energy industry. The top issues of the moment may change in the years ahead but they inevitably will shape the key components of our energy policy. We have endeavored not to let today's issues deter us from crafting initial subcommittee policy recommendations that will ensure long-term success.

Goals

Four overarching objectives provide a balanced framework for efforts to create a bright and vibrant energy future for Kentucky.

- To retain the viability of the Kentucky economy through sound energy policies.
- To improve the environmental performance of Kentucky's energy sector.
- To ensure energy reliability and security for the residents of the Commonwealth.
- To ensure that energy users receive low-cost energy services.

The critical elements of a successful Kentucky Energy Policy include:

- Leveraging Energy Education and Consumer Awareness
- Promoting Technology in the Energy Industry
- Adequate Kentucky-Based Electric Generation and Environmentally Responsible Use of Kentucky Coal
- Natural Gas and Petroleum Issues in the Commonwealth
- Energy Efficiency and Alternative Energy Applications
- Nuclear Industry in the Commonwealth
- Long-Range Energy Policy Issues

INITIAL Policy Recommendations for Kentucky's Energy Sector

Leveraging Energy Education and Consumer Awareness For a Bright Energy Future

The Board recommends that Kentucky explore the concept of creating the Kentucky Energy Education Development Program, this multi-disciplined elementary and secondary education program offering state-wide workshops for students and teachers, curriculum development, teacher training, and an opportunity for networking among students and teachers on energy issues.

The Board also believes that the Energy Education Development Program could sponsor youth awards ceremonies for various energy education projects throughout the Commonwealth and provide internship experiences for high school juniors and seniors in energy/environment-related fields. Efforts should be made to secure as much student and school participation as possible and to obtain the help of the U.S. Department of Energy and U.S. Environmental Protection Agency to serve as leaders in education curriculum development.

All five sub-committees – Coal, Electricity, Natural Gas and Petroleum, Energy Efficiency and Alternative Energy, and Nuclear Energy – repeated the same theme to increase consumer awareness of:

- Where Kentucky's energy comes from,
- How it is created,
- What the end products are,
- How it can be used more efficiently,
- What the environmental impacts are and
- What the energy industry brings to the economy of Kentucky.

In addition to the school based program, Kentucky should create and sustain a collaborative, coherent, and comprehensive education program targeting awareness among consumers and the general public, policy-makers, K-12 students and teachers, post-secondary education, and the state's work force. It is important that Kentuckians in all areas get a better understanding of the impact of energy on the state's economy and environment as well as on the lives of workers, consumers and communities. An effective education program would focus on, energy reliability, energy efficiency and the environment.

In addition, the Kentucky energy industry has clearly stated that there is a deficiency in graduates with energy-related degrees from the universities in Kentucky. We graduate very few energy-related bachelor's or master's degrees and have difficulty retaining them in the State. To address this issue, we need to increase the college graduates in energy-related fields by providing tuition scholarships that are linked to the Kentucky Higher Education System.

Funding streams and sources should be created to support consumer awareness of energy issues, sources, cost efficiency and diversity programs. To do that we must provide continuing education training and technical assistance on energy efficiency and renewable energies, alternative energy, technologies, and design methods for architects, designers, engineers, and developers.

Kentucky's final Energy Policy should be one of energy education and awareness. The following preliminary recommendations have been developed by the Energy Policy Advisory Board to address energy education.

- Create a voluntary program, led and funded by industry in the Commonwealth, to increase the general awareness of the role of energy industries in the State's economy. The components of energy production and use should be included.

- Provide educational programs that enable Kentucky citizens to make wise and efficient energy choices.

- Develop Kentucky's university programs to encourage energy-related fields by providing tuition scholarships and intern programs with guaranteed employment in the energy industries of Kentucky.

- Develop outreach programs dealing with energy issues and the environment and incorporate these energy education programs into the core curriculum of Kentucky's educational system.

- Expand the Kentucky NEED project which operates primarily in Northern Kentucky, and covers many energy education aspects, to a statewide program.

Promoting Technology in the Energy Industry

Developments in technology will be key to ensuring that Kentucky maintains its leadership position as an energy extractor and producer nationally, while providing affordable and cleaner energy sources for its citizens. Our goal is to provide and explore technical options that create an energy future that builds on our strengths and minimizes the environmental impact.

Because of this overarching goal, the Energy Policy Advisory Board recommends the creation of an Energy Council representing key energy stakeholders to ensure coordination of research and development strategies and secure federal funds. Kentucky needs to maximize the federal funds coming into the state to maintain cutting-edge technologies. Research and development is a critical component of the energy strategy, as is technology. To reach our goal we should consider providing a percentage of the coal severance tax and other fossil fuel taxes to fund the Energy Council's research and development activities.

In addition, we should develop centers of excellence to promote research and development in energy efficiency, renewable and alternative energy sources, and

the nuclear industry, as well as reliability and demand responses, in addition to coal, oil and natural gas.

Our preliminary policy recommendations to enhance the business climate for energy in Kentucky, while promoting the environment are:

- Re-examine the allocation of the coal and oil and gas severance taxes to promote energy research and development in the Commonwealth for four purposes:

    1. To develop environmentally acceptable methods for energy extraction and production.
    2. To enhance Kentucky's competitive energy advantage.
    3. To ensure Kentucky is actively engaged in cutting edge technology development through the Center for Applied Energy Research (CAER),
    4. To ensure Kentucky is actively engaged in advanced fossil fuel exploration and production assessment, gas storage, and carbon sequestration research and development through the Kentucky Geological Survey and the State universities' geological science programs.

- Create technical options to maintain Kentucky's competitive position in electricity and for environmental protection.

- Create a single governmental entity to pull disparate parts of the energy extraction, production, efficiency, and alternative energies into one voice for the purpose of cohesive policy formulation and the acquisition of federal funds for advanced technology, and research and development at Kentucky's institutions for higher learning and centers of excellence.

Adequate Kentucky-Based Electric Generation and Environmentally Responsible Use of Kentucky Coal

Every step in the energy production-to-consumption process relies on at least one element of infrastructure. Reaching our goals will be possible only if the right physical assets exist throughout Kentucky and if there is a clean and efficient manner in which Kentucky's current reserves of high- and low- sulfur coal can be extracted and used.

A successful energy policy should balance environmental and health effects with the reliable energy needs of our citizens. Further considerations include the impact of environmental regulations on energy supply and reliability, as well as the need to encourage more environmentally benign energy production, while ensuring that the state's industry remains economically competitive in the global market place.

Issues faced by the industry generally focus on the reduction of emissions at coal-fired power plants. The federal and state environmental protection agencies are working to develop a multi-pollutant strategy for fossil fuel combustion with the goal of reducing the compliance cost and allowing more strategic development of regulations while minimizing their potential impact upon the energy supply. It is worth noting that recent activities of the Bush Administration have begun to address the issue of New Source Review. However, governors and attorneys generals of the Northeastern states have threatened continued litigation in an effort to force coal-fired power plants to comply with much more stringent environmental regulations.

Currently under debate in Congress is a multi-pollutant strategy for coal-fired power plants that would principally address emissions of sulfur dioxide (SO_2), nitrogen oxide (NO_x), mercury (Hg) and carbon dioxide (CO_2). This bill would have a substantial impact on both the extraction and combustion portions of the energy industry and the environment.

Various federal, legislative, and regulatory mandates have resulted in a number of coal-fired power plants switching to western United States coal, which has significantly lower sulfur content than Kentucky coal. Plants that have switched have generally found it to be more cost-effective than adding air pollution control devices to allow the continued use of high-sulfur coal. However, new emission standards may result in further reductions of SO_2 and NO_x. These reductions may cause additional pollution controls to be installed on power plants, whether they are fueled by Western United States coal or Eastern compliance coal.

The issue of mercury emissions from power plants is also being discussed at the national level, and it appears that a consensus is forming that the emissions are significant enough to warrant future control.

In addition to the federally mandated emissions standards, the continued growth of peaking plants in the Commonwealth has sparked extensive debate. The 2002 General Assembly passed legislation dealing with the siting of merchant power plants and regulated utility power plants and transmission lines. This bill seeks to impose order and balance on the plant siting issue while looking at the cumulative impact of the emissions from these plants on Kentucky's environment and its citizens.

The Kyoto protocol, although not yet ratified by the United States, could result in the United States imposing even more drastic controls on the sources of greenhouse gases, principally CO_2. Any energy policy for the Commonwealth should include a plan for reducing or offsetting greenhouse gas emissions and encouraging voluntary practices, including carbon sequestration strategies. The Commonwealth should anticipate potential enactment of this protocol, or some variation of it, at some point in the future.

In addition to air quality impact considerations, which are substantial, we must be mindful of water quality and quantity impacts as a result of power plant siting. Management of the state's rivers, streams and water resources in general is a

critical element, especially in light of the coal industry's impact on that natural resource. Slurry pond runoff and acid mine drainage continue to be issues in the state.

INITIAL Policy Recommendations for the Coal and Electricity Generation and Transmission Industry in the Commonwealth

- Explore the financial implications and economic impact and volatility of offering tax credits, accelerated depreciation or other incentives to help the private sector develop technologically advanced coal-fired generation capacity.

- Investigate the use of coal extraction and delivery technology that will stimulate coal production in Kentucky, while minimizing the environmental and community impact associated with mining.

- Ensure that the recipients of power generated by coal-by-wire facilities located in Kentucky fully fund any cost associated with environmental offsets as well as with new or upgraded transmission facilities.

- Become a leader in energy infrastructure development by working with regional utilities and generation and transmission planners.

- Identify impediments to investment in and cost recovery from energy-related projects.

- Convene a national discussion involving all segments of the coal extraction, transportation, production and combustion sectors. This discussion should identify alternative markets for Kentucky coal and determine why Kentucky coal industry is less competitive and what can be done to improve the product.

- Ensure that Kentucky customers continue to have priority access to Kentucky's low-cost electricity.

INITIAL Policy Recommendations for the Natural Gas and Petroleum Industry in the Commonwealth

As Kentucky looks toward developing a twenty-year energy policy, a number of initiatives can help enhance the availability of affordable natural gas and petroleum in Kentucky:

- In an effort to quantify and qualify the existing and potential natural gas and petroleum reserves in the state, investor-owned gas utilities and municipals should cooperate with the GIS/mapping professionals at the Public Service Commission, the Kentucky Geological Survey and the Oil and Gas Division, of the Department of Mines and Minerals to produce detailed maps of the intrastate pipeline system. These maps would show city and county boundaries overlaid by major pipelines, distribution systems and laterals, in support of developing Kentucky's natural resources, similar to maps that exist in Indiana, Ohio and Illinois.

- The oil and gas industry, the Kentucky Geological Survey, and the State universities' geological sciences programs should collaborate to carry out exploration and production, assessments, carbon sequestration research and development.

- All utilities, pipelines, the Public Service Commission, the Kentucky Geological Survey, and the Oil and Gas Division should collaborate to assemble a database (including production and geologic data) for past and current gas fields to accelerate the identification and development of new natural gas storage fields.

- In light of the present security concerns regarding the energy infrastructure, appropriate guidelines for the distribution of and access to this information must be developed to provide access to persons with legitimate business and policy-making interests.

- Kentucky lawmakers should work with local producers, intrastate pipelines and distributors to determine what economic policies, such as severance, income and marginal well tax credits can most appropriately encourage investment in state-of-the-art exploration and production research equipment, drilling and development of distribution infrastructure.

- Through legislation, or other means, a solution to the Coalbed Methane mineral rights ownership issue must be developed.

- No long-term energy plan can accomplish its objectives without long-term expertise and leadership. Kentucky must work with energy industry leaders and educators to develop the appropriate incentives to attract students to the study of geology and petroleum engineering, not unlike the incentives used to attract students to the teaching profession.

INITIAL Policy Recommendations for Energy Efficiency and Alternative Energy Applications In the Commonwealth

- Require new state government buildings to be highly efficient and use integrated design procedures, where all the parties work together on the design of high-performance buildings. (When Florida did this, they found that the cost of new state buildings actually went down, and they came on line faster than in the old, fragmented, low-bid design and construction process.)

- The General Assembly should institute net metering to encourage environmentally sound distributed generation. Net metering is a policy implemented in thirty-five states whereby electricity customers who generate their own clean energy can run their electric meter backward when they generate more electricity than they use. This can help the customer, the utility company, and the Commonwealth by diversifying our energy sources and reducing pollution.

- Diversify the energy portfolio through a renewable energy standard to require utilities to generate a certain percentage of their power from renewable energy sources. Utilities can meet the standard by installing the technologies themselves or buying credits from other companies that install them.
- Incentives in the form of rebates or tax credits should be established for energy efficiency and alternative energy technologies. They are financed through adding a small public benefits charge to each kilowatt hour (KWh) of electricity sold. The public benefits charge could also support energy education and research on clean energy technologies and could help low-income customers pay their energy bills.
- Develop state tax credits for alternative fuels automobiles including hybrid and fuel cell use.
- The Public Service Commission should review the procedures that require utilities to assign full cost accounting and monetary values to the environmental, health, and risk impacts of various energy sources when they are making plans for future construction and planning.
- The benefits that energy efficiency and alternative energy can contribute should also be made a part of our environmental regulatory structure. Kentucky's State Implementation Plan to reduce air pollution should allow companies to claim credit when they reduce pollution by improving energy efficiency or installing alternative energy technologies. Our pollution enforcement agencies could encourage or require violators to invest in energy efficiency or alternative energy in exchange for reducing their fines. This process is known as supplemental environmental projects.

- The Public Service Commission should investigate a regulatory structure that does not discriminate against the implementation of energy efficiency and alternative energy technologies. Rate structures that allow energy efficiency and alternative energy technologies to compete equally with supply and generation options should be further reviewed and developed.
- The Public Service Commission and the General Assembly should identify and eliminate regulatory barriers to the cogeneration of electricity, heating and cooling.

INITIAL Policy Recommendations for the Nuclear Industry In the Commonwealth

A number of initial policy initiatives can help to advance the viability of Kentucky's participation in the nuclear industry. They include the following:

- Kentucky should endeavor to ensure that USEC builds the commercial enrichment plant is built in Paducah, Kentucky.

- The state should work to ensure that legacy environmental problems at Paducah are resolved as efficiently as possible. Controversy continues to surround the clean-up of nuclear waste generated over the last fifty years. The Natural Resources and Environmental Protection Cabinet continues to work with the U.S. Department of Energy and the U.S. Environmental Protection Agency to determine the path forward.

- However, Kentucky cannot accept a plan without milestones setting target dates for the clean-up of hazardous material sites. In addition, Kentucky cannot accept lower clean-up standards that would endanger the health of its citizens or the environment.

- If the U. S. Department of Energy and the U.S. Environmental Protection Agency determine that milestones can be moved or that certain clean-up programs can be postponed, it is Kentucky's policy that long-term stewardship commitments must be funded by the U.S. Department of Energy.

- The state should work with the Kentucky Community and Technical College System and other educational institutions to develop educational programs sufficient to ensure an adequately trained work force to support the nuclear industry within the state. In addition, Kentucky must work with energy industry leaders and educators to develop the appropriate incentives to attract students to engineering fields related to the support of the nuclear industry, not unlike the incentives used to attract students to the teaching profession.

- The state should continue to support the Kentucky Consortium for Energy and Environment as it seeks to develop new commercial opportunities associated with the nuclear energy facilities in Paducah.

INITIAL Policy Recommendations for Long-Range Energy Issues

Some energy issues, especially the area of research, development and technology, will mature over decades. This type of long-range energy issue and the decisions made by policy-makers, elected leaders, and other officials will determine how the state uses its natural resources, how it continues to deliver reliable and affordable energy to its citizens, how it expands its leadership position nationally and internationally, and how it develops the quality of life as well as educational opportunities for its citizens.

One of the objectives in achieving this goal is to create an Energy Commission that includes non-governmental representatives to monitor, review, and advance budget and regulatory policies affecting the implementation of the state energy policies and programs.

One of the responsibilities of this Energy Commission will be to effectively communicate with the federal government, local governments and other federal and state agencies regarding the state's intended energy policy.

A second responsibility will be monitor, review, and advance Kentucky's energy policy interests at the federal level. Perhaps the most critical issue affecting our ability to reach our energy goals is a comprehensive legislative and regulatory policy to support Kentucky's economic future in the energy industry. An Energy Commission should be created to combine the efforts of the Commonwealth in energy exploration, production, extraction, efficiency, alternative energy, nuclear energy, carbon sequestration and energy policy.

Kentucky should maintain its current position regarding the Standard Market Design, which is a Federal Energy Regulatory Commission program to redesign the transmission system in the United States. A program going forward that exercises caution, emphasizes regional perspectives, and recognizes unique regional differences in the energy market and the concept of cost-causer pays, should be developed.

Additional legislation should be developed to promote energy education at all levels in the Commonwealth. The Governor specifically asked the Energy Policy Advisory Board to look at the concept of coal bed methane to see if it is another energy opportunity for the state or another energy sector that the state can utilize. We believe it should be addressed by the new Energy Commission.

Technology has now advanced to the point where coal bed methane can be economically extracted from existing coal reserves. We need to address the issue of mineral rights surrounding both of these natural resources. Further activity by the Kentucky General Assembly should center around delineation and demarcation of ownership interests in coal as well as coal bed methane. Successful resolution of this issue will enable this market to develop and create opportunities for the extraction and marketing of coal bed methane.

Future activities include securing federal grants to determine the potential and economic viability of extraction of coal bed methane from Illinois Basin coal, primarily situated in Western Kentucky. If successful and viable in the marketplace, this approach would be adopted for coal reserves in Eastern Kentucky.

Deep and difficult to find natural gas resources should be developed by promoting research and development efforts in the Commonwealth. Further efforts should include evaluating the potential of CO2 sequestration through the geologic trapping mechanisms, especially where sequestration can stimulate and result in additional oil and gas production.

In light of the new and developing coal-sourced electrical generation in the states, coal and slurry pond resources should be reassessed.

Kentucky has made progress in mining safety, environmental controls and regulation. Current issues faced by the coal industry include mountain-top removal and slurry pond containment. In short, Kentucky's coal industry is attempting to find the path forward in terms of advanced generation technologies using Kentucky coals.

Many of the energy infrastructure issues that make Kentucky’s energy sector strong (i.e. location on pipeline alley, rail and barge access, adequate electric generation, transmission and distribution systems) also make the state vulnerable to possible terrorist attacks. Coordination with state and federal emergency teams regarding state of the art technologies and proven security technologies should be enhanced.

Conclusion

The Governor is keenly committed to finalizing a 20-year energy plan and developing state initiatives and programs associated with the plan by December 2002. Promoting Kentucky's energy sector, both domestically and internationally, will remain a high priority as well as a long-term commitment from the Commonwealth.

The Kentucky Energy Policy Advisory Board has received several requests from the stakeholders for *additional time to review and comment* on the long-term energy plan. For the energy plan to be successfully implemented three things are required: grass roots political support, support from the university's trend team verifying the science behind the plan and concise and agreed upon policy recommendations. The Interim Report precedes the issuance of the final long-term energy strategy. This report compiles the initial energy policy recommendations of the five subcommittees: Coal, Electricity, Natural Gas and Petroleum, Energy Efficiency and Alternative Energy, and Nuclear Energy. It is recommended that this report serve as the foundation for the final Long-Term Energy Plan for the Commonwealth.

Process Issues

The KEPAB followed the strategic planning process set out by the Empower Kentucky Center of Excellence in Government office. Our success in the project was dependent on our adherence to the process. The KEPAB made great progress in our planning efforts, but our work was diverted by time constraints. The body of important work to date results in policy recommendations for each of the five subcommittees representing the energy sector in Kentucky. While the policy recommendations of the various groups may seem to be in conflict, they are *not* mutually exclusive. *Energy efficiency and environmental stewardship can coexist with the energy industries in Kentucky*.

Lessons Learned

Looking back there have been several lessons learned as we progressed through the writing of the draft plan. In short, trying to get a legislative package together prior to issuance of the energy policy created credibility issues. Time constraints required that we provide a limited amount of time for comment, which proved to be unacceptable to most of the participants.

Recommendations for the Path Forward

The Kentucky Energy Policy Advisory Board (KEPAB) started with high level discussion and with an inclusive process that allowed all stakeholders voices to be heard. Expectations have been created for continued industry involvement. The University of Kentucky Trends team and the Western Kentucky Consortium for Energy and the Environment have expressed a collaborative interest in reconvening those groups that participated in the process. The KEPAB encourages and recommends that this consensus process continue. These two well-respected groups have agreed to work together to find a path forward and reconvene the subcommittee chairs, the core team and the trends team for the purpose of developing a final energy policy plan for the state.

Just as with the national energy plan, intense debate and discussions are to be expected and welcomed as we continue our work towards development of the final plan. The Kentucky Energy Policy Advisory Board thanks all participants in the process for their service to this administration in this very important effort.

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